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U.S. DEPARTMENT OF AGRICULTURE

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FARMER COOPERATIVE SERVICE
Washington, D. C.

SELECTED DATA ON

ARTIFICIAL BREEDING OF DAIRY CATTLE

By

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This report was prepared for use of interested cooperatives and selected State and Federal employees.

Service Report 20

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FARMER COOPERATIVE SERVICE
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Joseph G. Knapp, Administrator

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The Farmer Cooperative Service conducts research studies and service activities of assistance to farmers in connection with cooperatives engaged in marketing farm products, purchasing farm supplies, and supplying business services. The work of the Service relates to problems of management, organization, policies, financing, merchandising, product quality, costs, efficiency, and membership.

The Service publishes the results of such studies; confers and advises with officials of farmer cooperatives; and works with educational agencies, cooperatives, and others in the dissemination of information relating to cooperative principles and practices.

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HIGHLIGHTS

Artificial breeding of dairy cattle continues to expand in the United States. The rate of growth has levelled off, however. The first organization to specialize in this activity was established in 1939. Each year since then the number of cows bred annually has increased. In 1955, nearly 5½ million cows were bred artificially.

There are now 79 bull studs maintained by dairy breeding enterprises. They function through 1,502 organizations (mostly service units) and serve nearly two-thirds of a million herds.

The average bull stud bred a total of more than 68 thousand cows in 1955, served 8,400 herds, and averaged 2,210 cows per bull in service. These new highs represented much progress in recent years, and contributed greatly to current operating efficiency.

Farmer cooperatives own and operate 60 of the 79 bull studs. In 1955, they inseminated 72 percent of all cows artificially bred in the United States.

There are nearly as many very small cooperative associations -- breeding less than 10,000 cows annually -- as there are large associations -- breeding more than 100,000 cows each year. However, the number of small cooperatives is decreasing whereas the number of large associations is increasing. In 1955, there were 13 associations that bred over 100,000 cows; in 1949, there were only 2.

The 20 largest cooperatives bred nearly 3 million cows in 1955. This was about three-fourths of the combined volume of all 60 cooperative studs, and well over half the United States total for all breeding organizations.

Of the 20 largest cooperatives 3 are in Wisconsin. This is not surprising since more than 1 million cows were bred artificially in that State last year. This was more than twice the number in Minnesota, the State ranking second in volume.

The 20 largest cooperatives bred 2,636 cows in 1955 per bull in service on January 1, 1956. This was about 20 percent above the national average and reflected operating efficiency based on volume.

Balance sheet summaries for the central units of 6 federated cooperatives in 1954 showed a wide range for each major item. Total assets averaged $1,120 per cow of the daily average number inseminated. As a group, the associations were in strong financial condition.

Balance sheet summaries for 3 centralized cooperatives in 1954 also showed wide ranges. Total assets averaged $1,604 per cow of the daily average number inseminated. This was higher than for the central units of federated associations because in federations the actual insemination operations are handled by affiliated locals. Like the federations, the centralized associations were in strong financial condition.

Operating statements for central units of federated cooperatives in 1954 showed that 4 had substantial net margins, 1 had a relatively large net margin, 1 had no net margin, and 1 had a small loss. In each case, "salaries and wages" was the principal cost item. Differences between associations for various costs reflected differences in kind of operations, service or efficiency.

Operating statements for 3 centralized cooperatives in 1954 showed that all had large net margins. "Salaries and wages" accounted for more than half the total expense for each association. (Centralized associations employ their inseminators whereas in a federation such technicians are employed by the local units.)

Miscellaneous information on 1954 operations of 10 selected cooperatives reflected differences in area, kind of services, or level of efficiency. The number of cows bred per inseminator ranged from about 1,100 to nearly 2,300. Breeding fees (first service plus two more if necessary) ranged from 5 to 7 dollars with 6 dollars the most common amount. Annual wages for "typical" inseminators ranged from $4,300 to $6,750 with no mileage allowance, and from $3,400 to $4,700 with mileage allowance.

The usual rate of dilution of semen in 1954 among the selected cooperatives was 1 to 50 but one association maintained a rate of 1 to 100. All 10 of the cooperatives had good conception rates. Annual average rates ranged from 68 to 73, based on 60- to 90-day nonreturns as percentages of first inseminations.

Data in this report indicate that cooperatives serving farmers by artificial breeding of dairy cattle are continuing to progress and promise even greater service in the future.

Table 1. Growth of artificial breeding of dairy cattle in the United States, 1939-56

Year (Jan. 1)	Organizations (Units) 1/	Herds	Sires in service	Cows bred (calendar year)
	Number	Number	Number	Number
1939	7	646	33	7,539*
1940	30	2,971	138	33,977*
1941	42	5,997	237	70,751*
1942	73	12,118	412	112,788*
1943	99	23,448	574	182,524*
1944	95	28,627	657	218,070*
1945	195	43,998	729	360,732*
1946	336	73,293	900	537,376
1947	608	140,571	1,453	1,184,168
1948	963	224,493	1,745	1,713,581
1949	1,263	316,177	1,940	2,091,175
1950	1,460	372,968	2,104	2,619,555
1951	1,653	467,224	2,187	3,509,573
1952	1,648	543,397	2,324	4,295,243
1953	1,623	571,921	2,598	4,845,222
1954	1,432	606,997	2,661	5,155,240
1955	1,476	593,190	2,450	5,413,874
1956	1,502	661,497	2,553	-

1/ Includes both cooperative and other organizations.

* Prior to 1946 cows were reported only on the basis of enrollment.

Source: Agricultural Research Service, U. S. Department of Agriculture.

Table 2. Number and size of bull studs maintained by dairy breeding organizations, United States, 1939-56

Year (Jan. 1)	Bull studs 1/	Average per bull stud			Cows bred (calendar year) per sire
		Herds	Sires in service	Cows bred (calendar year)	
	Number	Number	Number	Number	Number
1939	6	108	5	1,256*	228*
1940	25	119	6	1,359*	246*
1941	35	171	7	2,021*	299*
1942	45	269	9	2,506*	274*
1943	59	397	10	3,094*	318*
1944	56	511	12	3,894*	332*
1945	69	638	11	5,228*	495*
1946	77	952	12	7,526	597
1947	84	1,673	17	13,393	815
1948	91	2,467	19	19,157	982
1949	90	3,513	22	26,802	1,078
1950	97	3,845	22	29,150	1,245
1951	95	4,918	23	42,923	1,605
1952	94	5,781	25	45,694	1,848
1953	96	5,958	27	50,471	1,865
1954	93	6,527	29	55,433	1,937
1955	79	7,509	31	68,530	2,210
1956	79	8,373	32	-	-

1/ Includes both cooperative and other organizations.

* Prior to 1946 cows were reported only on the bases of enrollment.

Source: Based on data published by the Agricultural Research Service, U.S.D.A.

Table 3. Size distribution of dairy breeding cooperatives, United States, based on number of cows bred in 1955

Cows bred	Associations 1/
Number	Number
Less than 10,000	11
10,000 - 19,999	9
20,000 - 29,999	5
30,000 - 39,999	6
40,000 - 49,999	6
50,000 - 59,999	2
60,000 - 69,999	3
70,000 - 79,999	3
80,000 - 89,999	2
90,000 - 99,999	0
100,000 and over	13
Total	60

1/ Includes only those operating bull studs; does not include local units.

Source: Based on data published by the Agricultural Research Service, U.S.D.A.

Table 4. - Number of cows bred by the 20 largest dairy breeding cooperatives, and number of cows bred per sire, 1955

Association	Cows bred in 1955	
	Total	Per sire in service1/
	Number	
New York Artificial Breeders' Cooperative	381,505	2,631
Badger Breeders Cooperative (Wis.)	292,159	4,115
Minnesota Valley Breeders Association	272,957	5,808
Tri-State Breeders Cooperative (Wis.)	215,068	2,906
Consolidated Breeders Cooperative (Minn.)	171,677	2,682
Michigan Artificial Breeders Cooperative	171,500	2,486
Eastern Iowa Artificial Breeding Association	171,194	3,003
Central Ohio Breeding Association	168,138	3,233
Northern Ohio Breeders' Cooperative Association	131,941	2,807
Western Pennsylvania Artificial Breeding Cooperative	118,929	1,775
Northern Illinois Breeding Cooperative	117,285	2,058
Evergreen Northwest Breeders (Wash.)	104,142	2,604
Southeastern Pennsylvania Artificial Breeding Cooperative	101,705	4,238
NEPA Artificial Breeding Cooperative (Pa.)	87,488	1,785
Southern Wisconsin Breeders Cooperative	82,117	2,219
Iowa Breeders Cooperative	76,969	1,749
M.F.A. Artificial Breeding Association (Mo.)	73,364	1,287
Southern Illinois Breeding Association	72,096	1,534
Cache Valley Breeding Association (Utah)	66,287	2,455
Kentucky Artificial Breeding Association	64,968	1,585
Total or average	2,941,489	2,636

1/ On January 1, 1956

Source: Based on data published by the Agricultural Research Service, U.S.D.A.

Table 5. — Balance sheet summaries, per cow of daily average number inseminated, for central units of 6 federated dairy breeding cooperatives, 1954

Item	Association number 1/						Range	Average
	2	3	4	5	6	7		
						Over		
Cows inseminated daily (approx.)	80	110	110	130	190	300	-	-
Assets:								
Current	$256	$ 705	$298	$ 103	$393	$380	$103-705	$ 356
Fixed (net)	671	1057	593	1246	482	373	373-1246	737
Other	15	34	30	12	15	59	12-59	27
Total	942	1796	921	1361	890	812	812-1796	1120
Liabilities:								
Current	110	93	10	91	33	58	10-110	66
Other	306	-	-	349	-	-	0-349	109
Total	416	93	10	440	33	58	10-440	175
Patrons' equities - Total	526	1703	911	921	857	754	526-1703	945
Total Liabilities and Patrons' equities	942	1796	921	1361	890	812	812-1796	1120

1/ Numbers in this table refer to the same associations as do the numbers in tables 7, 9 and 10.

Source: Based on records of the individual cooperatives.

Table 6. - Balance sheet summaries, per cow of daily average number inseminated, for 3 centralized dairy breeding cooperatives, 1954

Item	Association number 1/			Range	Average
	8	9	10		
			Over		
Cows inseminated daily (approx.)	80	200	300	-	-
Assets:					
Current	$ 345	$ 470	$ 731	$ 345-731	$ 515
Fixed (net)	2045	674	468	468-2045	1062
Other	17	48	15	15-48	27
Total	2407	1192	1214	1192-2407	1604
Liabilities:					
Current	174	173	134	134-174	160
Other	308	5	-	0-308	104
Total	482	178	134	134-482	264
Patrons' equities - Total	1925	1014	1080	1014-1925	1340
Total Liabilities and Patrons' equities	2407	1192	1214	1192-2407	1604

1/ Numbers in this table refer to the same associations as do numbers in tables 8, 9 and 10.

Source: Based on records of the individual cooperatives.

Table 7. -- Number of cows inseminated and receipts, expenses, and margin or loss, per cow inseminated during year, of central units of 7 federated dairy breeding cooperatives, 1954

Item	Association number 1/							Range	Average
	1	2	3	4	5	6	7		
							Over		
Cows inseminated (approx.)	20,000	30,000	40,000	40,000	50,000	70,000	100,000	-	-
Receipts:									
Breeding fees	$1.95	$1.75	$2.58	$2.11	$1.95	$2.35	$2.04	$1.75-2.58	$2.10
Other receipts	.23	2/	.24	.06	.05	.03	.01	2/ - .24	.09
Total	2.18	1.75	2.82	2.17	2.00	2.38	2.05	$1.75-2.82	2.19
Expenses:									
Salaries and wages	.66	.58	.85	.75	.56	.61	.63	.56- .85	.66
Travel	.24	.10	.11	.16	.21	.19	.16	.10- .24	.17
Office supplies	.05	.04	.03	.05	.05	.03	.04	.03- .05	.04
Laboratory supplies	.09	.04	.05	.04	.14	.13	.03	.03- .14	.07
Farm and barn supplies	.04	.02	.06	.01	.05	.03	.04	.01- .06	.04
Livestock	.12	.10	.01	.01	.07	.07	.03	.01- .12	.06
Repairs, maintenance	.03	.01	.07	.08	.04	.04	.01	.01- .08	.04
Feed and bedding	.33	.21	.26	.24	.07	.12	.08	.07- .33	.19
Electricity, water, heat	.02	.02	.04	.03	.06	.02	.02	.02- .06	.03
Telephone and telegraph	2/	.03	.01	.01	.04	.02	.01	2/ - .04	.02
Insurance	.04	.02	.02	.02	.04	.03	.01	.01- .04	.03
Taxes	.01	.01	.05	.02	.09	.04	.01	.01- .09	.03
Depreciation	-	.30	.37	.24	.41	.44	.17	0- .44	.27
Advertising	.06	.01	.16	.19	.03	.05	.13	.01- .19	.09
Semen purchases	-	-	.10	.04	-	-	2/	0- .10	.02
Semen shipping	.22	.18	.04	.06	.10	.10	.10	.04- .22	.11
Audit and legal	.02	.03	.02	2/	.01	.03	.01	2/- .03	.02
Miscellaneous	.13	.07	.11	.08	.03	.17	.47	.03- .47	.15
Total	2.06	1.77	2.36	2.03	2.00	2.12	1.95	1.77-2.36	2.04
Net margin (loss)	.12	(.02)	.46	.14	0	.26	.10	(.02)-.46	.15

1/ Numbers in this table refer to the same associations as do the numbers in tables 5, 9 and 10.
2/ Less than .005
Source: Based on records of the individual cooperatives.

Table 8. - Number of cows inseminated and receipts, expenses, and margin or loss, per cow inseminated during year, of 3 centralized dairy breeding cooperatives, 1954

Item	Association number 1/			Range	Average
	8	9	10		
			Over		
Cows inseminated (approx.)	30,000	70,000	100,000	-	-
Receipts:					
Breeding fees	$5.95	$6.97	$5.00	$5.00-6.97	$5.97
Other receipts	.08	.02	.08	.02- .08	.06
Total	6.03	6.99	5.08	5.08-6.99	6.03
Expenses:					
Salaries and wages	2.94	3.57	2.52	2.52-3.57	3.01
Travel	.02	1.62	.81	.02-1.62	.82
Office supplies	.06	.03	.04	.03- .06	.04
Laboratory supplies	.14	.11	.11	.11- .14	.12
Farm and barn supplies	.07	.01	.01	.01- .07	.03
Livestock	.08	2/	.02	2/ - .08	.03
Repairs, maintenance	.45	.04	.03	.03- .45	.17
Feed and bedding	.23	.13	.05	.05- .23	.14
Electricity, water, heat	.04	.02	.01	.01- .04	.02
Telephone and telegraph	.06	.12	.13	.06- .13	.10
Insurance	.15	.06	.04	.04- .15	.08
Taxes	.18	.08	.06	.06- .18	.11
Depreciation	.60	.19	.22	.19- .60	.34
Advertising	.11	.11	.17	.11- .17	.13
Semen purchases	.06	-	-	0- .06	.02
Semen shipping	.08	.14	.06	.06- .14	.09
Audit and legal	.02	.01	.02	.01- .02	.02
Miscellaneous	.20	.41	.40	.20- .41	.34
Total	5.49	6.65	4.70	4.70-6.65	5.61
Net margin (loss)	.54	.34	.38	.34- .54	.42

1/ Numbers in this table refer to the same associations as do numbers in tables 6, 9 and 10.

2/ Less than .005

Source: Based on records of the individual cooperatives.

Table 9. -- Miscellaneous information on operations of 10 selected dairy breeding cooperatives, 1954

Association number 1/	Cows bred per bull in service	Cows bred per inseminator	Breeding fee (first service) paid by farmer	Annual wage of "typical" inseminator 2/	Usual rate of dilution of semen
	Number	Number			
Federated:					
1	939	1,118 3/	$6.00	-	1 to 50
2	1,233	-	-	$4,300 (no mileage)	1 to 40
3	1,568	1,704 3/	$6.00 to $6.50	$6,200 (no mileage)	1 to 40
4	1,132	-	$5.00	-	-
5	1,061	1,646 3/	$5.00	$6,000 (no mileage)	1 to 50
6	1,874	2,248 3/	$6.00	$4,000 (plus mileage)	1 to 65
7	2,470	1,894 3/	$6.00	$6,750 (no mileage)	1 to 100
Centralized:					
8	962	-	$6.00	$4,700 (no mileage)	1 to 50
9	1,556	1,358	$7.00	$3,400 (plus mileage)	1 to 50
10	3,814	2,288	$5.00	$4,700 (plus mileage)	1 to 50

1/ Numbers in this table refer to the same associations as do the numbers in tables 5, 6, 7, 8 and 10.
2/ Further information on indirect payments and "fringe benefits" is needed to permit valid comparisons between cooperatives.
3/ Inseminators are employed by local member associations.

Source: Based on records of the individual cooperatives.

Table 10. -- Conception rates reported by 10 selected dairy breeding cooperatives, by months, 1954

Association number 1/	Conception rate (60- to 90-day nonreturns as percentage of first inseminations)												Simple average
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Federated:													
1	70	71	70	71	73	77	71	68	71	69	68	71	71
2	64	68	67	71	65	72	72	63	70	66	65	63	67
3	69	68	69	69	70	73	74	73	69	72	69	64	70
4	73	73	71	74	72	74	73	73	75	76	72	73	73
5	66	67	69	70	68	73	73	69	73	74	71	68	70
6	64	68	65	68	67	67	70	69	69	73	71	66	68
7	-	-	-	-	-	-	-	-	-	-	-	-	72
Centralized:													
8	68	72	72	71	74	73	72	66	71	73	74	71	71
9	69	71	71	74	72	73	65	66	71	72	69	68	70
10	-	-	-	-	-	-	-	-	-	-	-	-	70

1/ Numbers in this table refer to the same associations as do the numbers in tables 5, 6, 7, 8 and 9.

Source: Based on records of the individual cooperatives.